

Mr. Michael T. Davis
Algebra II Delta & Eta

Test - Unit III - First Half - Practice Test
Radicals, Exponentials, & Equations with Radicals
February 23, 2015

Name:

Mr. Davis Solutions

Directions: You may not use a calculator that simplifies radical expressions for you. In order to receive full credit for correct answers, all the steps in your work must be shown.

1. Simplify $8y^4 + y^5 + 9y^4 = 17y^4 + y^5$

2. Simplify $(2x^3)(3x)(4x^5) = 2 \cdot 3 \cdot 4 \cdot x^3 \cdot x \cdot x^5 = 24x^9$

3. Simplify $(4ab^2)^0 \cdot (3ab^3)^4 = 1(3^4 a^4 b^{12}) = 81a^4 b^{12}$

4. Simplify $(8^{-1}m^2)^{-2} = 8^2 m^{-4} = \frac{64}{m^4}$

5. Simplify $\frac{39m^8np^{-2}}{13m^3n^6p^4}$ and write without negative exponents

$$\frac{3m^5}{n^5p^4p^2} = \frac{3m^5}{n^5p^6}$$

$$6. \text{ Simplify } \sqrt{49f^4} + \sqrt[3]{-27f^6} = 7f^2 + -3f^2 = 4f^2$$

$$7. \text{ Simplify } x\sqrt{20x^5} + \sqrt{45x^7} = x\sqrt{4 \cdot 5x^4x} + \sqrt{9 \cdot 5x^6x} \\ = 2 \cdot x \cdot x^2\sqrt{5x} + 3x^3\sqrt{5x} \\ = 2x^3\sqrt{5x} + 3x^3\sqrt{5x} = 5x^3\sqrt{5x}$$

$$8. \text{ Simplify } 3\sqrt{6} \cdot 4\sqrt{27} = 3 \cdot 4 \sqrt{6 \cdot 27} = 12 \sqrt{2 \cdot 3 \cdot 9 \cdot 3} \\ = 12 \sqrt{81 \cdot 2} \\ = 12 \cdot 9 \sqrt{2} \\ = 108 \sqrt{2}$$

$$9. \text{ Simplify } (5 + \sqrt{4})(5 - \sqrt{4}) \\ 25 - 5\sqrt{4} + 5\sqrt{4} - \sqrt{16} \\ 25 - 4 \\ 21$$

$$10. \text{ Simplify } \frac{\sqrt{75x^4y^3}}{\sqrt{3x^2y^7}} = \sqrt{\frac{75x^4y^3}{3x^2y^7}} = \sqrt{\frac{25x^2}{y^4}} = \frac{5x}{y^2}$$

$$11. \text{ Simplify } 7\sqrt{15} - \sqrt{15} + 3\sqrt{10} = 6\sqrt{15} + 3\sqrt{10}$$

$$12. \text{ Simplify } 3\sqrt{12} + 4\sqrt{27} - 2\sqrt{48} = 3\sqrt{4 \cdot 3} + 4\sqrt{9 \cdot 3} - 2\sqrt{16 \cdot 3} \\ = 3 \cdot 2\sqrt{3} + 4 \cdot 3\sqrt{3} - 2 \cdot 4\sqrt{3} \\ = 6\sqrt{3} + 12\sqrt{3} - 8\sqrt{3} \\ = 10\sqrt{3}$$

13. Simplify $36^{\frac{3}{2}} + 125^{\frac{2}{3}}$

$$= (36^{\frac{1}{2}})^3 + (125^{\frac{1}{3}})^2 = (\sqrt{36})^3 + (\sqrt[3]{125})^2$$

$$= 6^3 + 5^2$$

$$= 216 + 25$$

$$= 241$$

14. Simplify 7^{-3} and write without negative exponents

$$7^{-3} = \frac{1}{7^3} = \frac{1}{343}$$

15. Simplify $(16x^5y)^{\frac{1}{3}} \cdot (54xy)^{\frac{1}{3}}$

$$= \sqrt[3]{16x^5y} \sqrt[3]{54xy}$$

$$= \sqrt[3]{8 \cdot 2 \cdot x^4 \cdot y^2 \cdot 27 \cdot 2} = \sqrt[3]{8 \cdot 27 \cdot x^4 \cdot y^2}$$

$$= 2 \cdot 3 \cdot x^{\frac{4}{3}} \cdot y^{\frac{2}{3}}$$

$$= 6x^{\frac{4}{3}}y^{\frac{2}{3}}$$

16. Solve $\sqrt{x+20} = 9$

$$\sqrt{81} = 9 \quad x+20=81$$

$$x=61$$

17. Solve $(8x)^{\frac{1}{3}} = 6$

$$\sqrt[3]{8x} = 6 \quad \sqrt[3]{216} = 6$$

$$8x = 216$$

$$x = 27$$

18. Solve $(15x-11)^{\frac{1}{2}} = 7$

$$\sqrt{15x-11} = 7 \quad \sqrt{49} = 7$$

$$15x-11=49$$

$$15x=60$$

$$x=4$$

Optional Challenge Problem

Solve $(6x-4)^{\frac{5}{3}} = 32$

$$6x-4 = 32^{\frac{3}{5}} \quad 6x-4 = (32^{\frac{1}{5}})^3$$

$$6x-4 = (\sqrt[5]{32})^3 \quad 6x-4 = (2)^3 \quad 6x-4 = 8 \quad 6x = 12$$

$$x = 2$$